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Record

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Washington University in St. Louis

WUSTL's excellence in nanotechnology recognized by NIH

By Tony Fitzpatrick

Washington University has been chosen as a Program of Excellence in Nanotechnology (PEN) by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health.

Karen L. Wooley, Ph.D., professor of chemistry in Arts & Sciences, is principal investigator of the program, which the NHLBI is funding at $12.5 million for five years.

Wooley

Three other PENs also will be established. WUSTL will serve as the administrative center for this initiative.

Collaborators with Wooley include 13 faculty members from Arts & Sciences and the School of Medicine, plus one from each of the University of California campuses at Berkeley and Santa Barbara.

Nanotechnology involves the making of materials, devices and systems of extremely small sizes, generally 1-100 nanometers. One nanometer is one one-thousandth of a micron. A single strand of human hair is 50-100 microns, so a nanometer is 50,000 times smaller than a human hair.

Nanotechnology enables researchers to take advantage of properties and surface areas to create faster, more efficient chips, sensors, pumps, gears, lasers, new materials and drug-delivery systems.

According to Wooley, the prime focus of WUSTL's PEN is the development of nanoscale agents that can be assembled, labeled, targeted, filled and activated for eventual diagnosis and treatment of various diseases relevant to the NHLBI.

"Having this program is invaluable to the advancement of nanotechnology because it brings together people with crucial skills and expertise, allowing them to cooperate with each other," Wooley said. "This will allow nanotechnology to coalesce into realized devices that are greater than the individual contributions alone.

"The initiatives we'll undertake will provide the leadership for nanoscience and nanotechnology developments that can have clinical applications through this century."

Elizabeth G. Nabel, M.D., director of the NHLBI, said the PENs represent "a vitally important research effort that will spur the development of novel technologies to diagnose and treat heart, lung and blood diseases."

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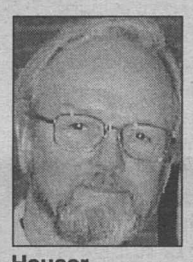


Heuser

Roediger

Schofield

American Academy of Arts and Sciences

3 faculty members elected

By Gerry Everding and Michael C. Purdy

Professors John E. Heuser, Henry L. "Roddy" Roediger III and Norman J. Schofield have been elected fellows of the American Academy of Arts and Sciences.

Heuser, M.D., is a professor of cell biology and physiology in the School of Medicine; Roediger, Ph.D., is the James S. McDonnell Distinguished University Professor and dean of academic planning in Arts & Sciences; and Schofield, Ph.D., is the William R. Taussig Professor of Political Economy in Arts & Sciences and director of the Center for Political Economy.

The three are among 213 men and women elected this year by the academy, an organization formed in 1870 to cultivate the arts and sciences and to recognize leadership in scholarship, business, the arts and public affairs.

"Washington University has a rich and long tradition of scholars who have been recognized nationally and globally for their contributions to science and the humanities," Chancellor Mark S. Wrighton said. "Professors Heuser, Roediger and Schofield join an elite group honored by the American Academy of Arts and Sciences, and we are all proud of their accomplishments and grateful for their continued association with our community."

The academy's membership of over 4,500 includes more than 150 Nobel laureates and 54 Pulitzer Prize winners. Fellows are selected through a highly competitive process that recognizes individuals who have made pre-eminent contributions to their disciplines and to society at large.

This year's new fellows and foreign honorary members will be welcomed during an Oct. 8 induction ceremony at the academy's headquarters in Cambridge, Mass.

Heuser created quick-freeze deep-etch electron microscopy, a pioneering technique that lets biologists take detailed pictures of fleeting events inside living cells. For decades, Heuser has used this tech-

See **AAAS**, Page 6

KEVIN LOWDER

A Major event Former British Prime Minister John Major (left) chats with Charles F. Knight, chairman emeritus of Emerson and chair of the Olin School of Business' National Council. Major was one of the keynote speakers at the recent International Business Outlook Conference at the Charles F. Knight Executive Education Center. Several master of business administration students organized the conference. Other speakers included Patrick Stokes, chief executive officer and president of Anheuser-Busch, and Richard Mahoney, former chief executive officer of Monsanto and the Distinguished Executive in Residence in the Olin School's executive M.B.A. program.

Gupta named dean of the Olin School

By Shula Neuman

Mahendra R. Gupta, Ph.D., senior associate dean of the Olin School of Business and the Geraldine J. and Robert L. Virgil Professor of Accounting and Management, will become dean of the business school July 1, according to Chancellor Mark S. Wrighton.

Gupta

Gupta will succeed Stuart I. Greenbaum, Ph.D., who is retiring from the position after 10 years of service.

"I'm delighted that Mahendra has accepted the appointment as dean of the Olin School of Business," Wrighton said. "Mahendra's 15 years at the University have prepared him well for his new position. Furthermore, his work as senior associate dean makes him a very knowledgeable successor for Stuart Greenbaum.

"I look forward to supporting his efforts as he continues strengthening Olin and its national and international programs."

Gupta has been a part of the Olin School since 1990. His research interests include strategic implication of cost information in e-commerce, technology, new ventures, manufacturing, health care, marketing and service sectors. He has been a consultant to various manufacturing firms and government agencies.

Gupta said he's looking forward to his new responsibilities.

"I'm very pleased and honored to have an opportunity to lead the school," Gupta said. "We have the potential to make Olin one of the premier global institutions for business education and research. We have world-class faculty, talented staff and a bright and vibrant student body.

"Indeed, our path to future success will be defined by key roles played by faculty, students, alumni and our loyal supporters in the business community. Furthermore, building on the success of our experience in Europe and China, we will make Olin a global

See **Gupta**, Page 6

Gene therapy corrects hemophilia in lab animals

By Gwen Ericson

Newborn mice and dogs with hemophilia A were restored to normal health through gene therapy developed by School of Medicine researchers.

The technique introduced into the animals' cells a gene that makes clotting factor VIII, a protein missing because of a genetic defect.

"We are really pleased with the results, because the animals produced about 20 times more factor than has been achieved in prior attempts using gene therapy for hemophilia A in dogs," said senior author Katherine Parker Ponder, M.D., associate professor of medicine and of biochemistry and molecular biophysics.

In addition, the technique using newborn animals had the advantage of not prompting an immune response, which in many other cases eventually blocks the blood-clotting activity of introduced factor VIII in hemophilic animals.

Since treatment more than a year ago, the blood of the mice and dogs in this study has maintained a normal level of clotting factor activity, and the animals have had no incidents of bleeding.

The study was reported in the April 26 issue of the *Proceedings of the National Academy of Sciences.*

Hemophilia is an inherited bleeding disorder caused by genetic mutations on chromosome X that prevent normal production of certain blood clotting factors. A defect ve gene for clotting factor VIII is responsible for hemophilia A, the form occurring in 80 percent of cases.

Because females carrying a defective gene can rely on a normal copy of the gene on their second X chromosome, hemophilia almost always occurs in males. One in 5,000 males are born with the disorder.

"Hemophilia greatly restricts patients' everyday lives," Ponder said. "People with the disease don't heal well after injuries or surgery. Even running can cause bleeding into the joints."

See **Therapy**, Page 6

Mary Ann & Des Lee honored by Harris community service award

BY BARBARA REA

A husband-and-wife couple has again been recognized with the Jane and Whitney Harris St. Louis Community Service Award, now in its sixth year.

This year, the honor was bestowed upon Mary Ann and E. Desmond "Des" Lee. As individuals and as a couple, they have been extraordinary citizens of St. Louis and have given back to their community in a host of ways.

The award, which is administered by the University, was presented by Chancellor Mark S. Wrighton at a recent Harbison House ceremony.

Winners receive a $25,000 gift for the St. Louis charity of their choice. The Lees' gift will benefit the Saint Louis Symphony Orchestra and Springboard to Learning.

In establishing the award in 1999, Whitney Harris and his late wife, Jane, said they wished to reward and recognize couples who are dedicated to improving the St. Louis area.

In a community where regional pride and philanthropy are hallmarks, the Lees stand out.

"Thousands of people are touched daily by the generosity of Mary Ann and Des Lee," Wrighton said. "From enhancing the experience of a visit to Forest Park to enhancing the educational experiences in our schools and universities, St. Louis is a much better place because of them.

"It is a distinct pleasure to thank them for all their good works."

Mary Ann Lee is involved in a number of local organizations and serves on the boards of the John Burroughs School, Opera Theatre of Saint Louis, Springboard to Learning, the Sheldon Theatre and Forest Park Forever.

The addition of the new Grand Basin fountains and the illumination of the statue of St. Louis enhance the newly renovated Forest Park, thanks to her generosity.

Helping St. Louis' youngest citizens also is a priority, and she gives her time and resources to help them succeed by being active in the Herbert Hoover Boys and Girls Club and Junior Achievement. Another favorite project is WiseWrite, a collaborative playwriting program that promotes literacy.

For her dedication and service, Mary Ann Lee has received the Variety Club's "Woman of the Year" award, the Hiram W. Leffingwell Award from Forest Park Forever, and together with her husband, the 2004 NAACP Humanitarian Award.

Des Lee's philanthropic interests are broad. A number of organizations — including the Herbert Hoover Boys and Girls Club, St. Luke's Hospital, United Way of Greater St. Louis and the Saint Louis Symphony Orchestra — count him as a member of their boards.

At WUSTL and the University of Missouri-St. Louis, he has established several professorships with the purpose of creating new collaborations to serve society, and in particular, the underserved communities within the metropolitan area.

Des Lee graduated from WUSTL in 1940 with a business degree. The year before his graduation, he co-founded the Lee/Rowan Co., which became a leading manufacturer of storage and organizational products.

For the past 12 years, he has devoted his time and talents to charitable causes.

Among his many awards are WUSTL's Robert S. Brookings Award, an honorary degree in humane letters from UMSL, the Martin Luther King Local Philanthropy Award and the NAACP Humanitarian Award twice.

He was included in *Worth* magazine's "100 Most Generous Americans" in 1995, and in 1999 he was named "St. Louis Philanthropist of the Year."

Springboard to Learning motivates, stimulates and inspires children to learn more about themselves and the world.

It provides 150 cultural and diversity programs annually to more then 15,000 schoolchildren in St. Louis city and county schools.

The Saint Louis Symphony Orchestra is an internationally renowned ensemble that performs an expansive repertoire and participates in a strong community partnership that supplements and complements other music-oriented educational initiatives.

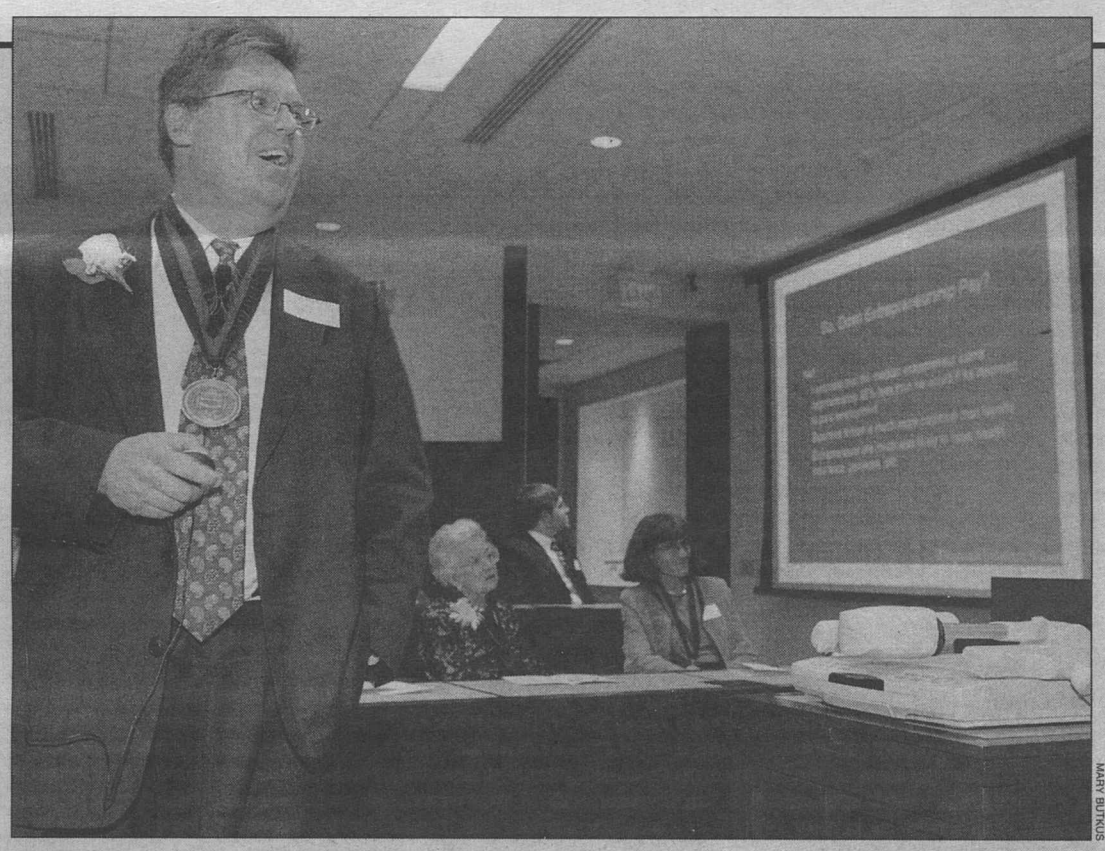
Also in attendance at the ceremony were Whitney Harris; his wife, Anna; and his son, Eugene.

Lou Fusz Jr. chairs the award selection committee for the Harris prize. Each fall, the committee considers nominations submitted from the St. Louis community. In addition to the cash prize for charity, Harris award recipients also receive an inscribed work of art.

Past winners and gift recipients are: Marilyn and Sam Fox for the Sam Fox School of Design and Visual Arts (2004), Elizabeth and William Danforth for The Women's Society of Washington University (2003), Ann and Lee Liberman for Forest Park Forever (2002), Alice and Leigh Gerdine for the St. Louis Black Repertory Co. (2001) and Lucy and Stanley Lopata for Habitat for Humanity (2000).

DAVID KILPER

Chancellor Mark S. Wrighton is flanked by Mary Ann and E. Desmond "Des" Lee at a recent Harbison House ceremony honoring the Lees as this year's recipients of the Jane and Whitney Harris St. Louis Community Service Award. Winners receive a $25,000 gift for the St. Louis charity of their choice; the Lees' gift will benefit the Saint Louis Symphony Orchestra and Springboard to Learning.



MARY BUTKUS

Brookings distinguished professor Barton H. Hamilton, Ph.D., professor of economics, of management and of entrepreneurship in the Olin School of Business, gives a presentation of his scholarly work at his recent installation as the inaugural Robert Brookings Smith Distinguished Professor in Entrepreneurship. Major gifts from The Bellwether Foundation and from Nancy Morrill Smith created the professorship. Robert Brookings Smith was an entrepreneur as well as a philanthropist, community leader and banking executive. Robert S. Brookings — chairman of the University's board from 1895-1928 — was his great-uncle.

Web site & quarterly competition encourage local entrepreneurs

BY SHULA NEUMAN

A Web site designed to capitalize on St. Louis' entrepreneurial energy was recently launched by the University's Skandalaris Center for Entrepreneurial Studies.

The site is IdeaBounce.com and will support the growth of innovation, collaboration and entrepreneurial activity.

IdeaBounce.com participants will also have a chance to air their ideas before a panel of judges during a quarterly event at the Olin School of Business. The first IdeaBounce event was held April 28 in May Auditorium.

IdeaBounce.com offers people from across the region a place to collaborate in the development of new ideas, said Chris R. Dornfeld, the University's entrepreneurship collaboration director. The Web site is attracting people who are looking for mentors, advisers, investors and other partners for their venture.

"We believe there are many great ideas in our community that, if supported by the right group of experienced people, will produce great community and economic benefit," Dornfeld said. "We hope IdeaBounce can help make those connections happen."

The Web site is complemented by the quarterly event, where 10-15 people will be given two minutes to present their ideas. Five judges will select five winners (at least two students), who will each receive $100 and an invitation to a VIP dinner after the event.

The events and Web site are free and open to the public. Registration in advance is required and can be done online at *ideabounce.com*.

Parking permit prices to increase

BY ANDY CLENDENNEN

This summer, all University parking permits will be up for renewal.

In addition to the walk-in renewal and mail-in renewal options offered in the past, parking services is now offering convenient online renewal to help simplify the process. The online renewal is fast and easy.

Thousands have purchased permits using this option since June 2004 when parking services first added the feature.

All permits will expire on June 30, including the three-year permits issued in 2002. Sometime in late May, current faculty and staff parking-permit holders will receive a renewal letter in campus mail providing complete instructions for permit renewal.

Parking permit fees

	2004-05	2005-06
Red	$780	$820
Yellow	$350	$365
Blue	$350	$365
Brown	$350	$365
Yellow Evening	$80	$85
Red Evening	$80	$85
Off-site	$80	$85
Student Summer	$80	$85
Official Business	$345	$360
Daily	$3.00	$3.50
Monthly	$60	$70
After hours	$10	$10

Permit holders who go through the renewal process should expect to receive their new permits around the middle of June.

Fees will increase effective July 1. The daily pass fee is also scheduled to increase on July 1, to $3.50 per day. The daily pass had not increased since 2001.

In addition, parking services will introduce a revised fine structure on July 1. There have been no increases to the current fine structure in the past 10 years, and now the structure is being adjusted to more effectively act as a deterrent for some violations.

The new structure includes increases to certain fines, which will be announced online. It is intended to enhance a program designed to protect the parking privileges of the permit-holder.

The Parking & Transportation Advisory Committee has reviewed and approved all increases.

For more information, go online to *parking.wustl.edu*.

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Washington University in St. Louis

School of Medicine Update

Oxygen near lens linked to cataracts

BY JIM DRYDEN

Researchers may be a step closer to understanding what causes cataracts and what may help prevent them.

In a study published in the *American Journal of Ophthalmology*, School of Medicine researchers report the culprit may be oxygen.

They measured oxygen concentrations in the eyes of patients undergoing retinal surgery. When a person has retinal surgery, standard practice calls for removal of the vitreous gel, a clear, jelly-like structure in the center of the eye.

This removal, called a vitrectomy, makes it easier for surgeons to repair the damaged retina.

After vitrectomy surgery, the surgeon replaces the vitreous gel with fluid. But not long after that, the eye begins to develop the clouding of the lens known as a nuclear cataract.

"It's fairly well-accepted in the field that anyone over 50 who has vitrectomy surgery will develop a cataract within two years," said Nancy M. Holekamp, M.D., the study's lead author. "But if we could understand this process and prevent it, patients would be better off."

Just before surgery, Holekamp, an associate professor of clinical ophthalmology and visual sciences, measured oxygen levels adjacent to the lens and near the center of the eye in the vitreous gel of 69 eyes.

Before retinal surgery, oxygen concentrations were very low in both places. After surgery, oxygen levels in both locations were about eight times higher than normal.

Although the retina has many blood vessels and high oxygen concentrations, the lens, separated from the retina by the vitreous gel, normally gets very little oxygen.

After surgery, however, oxygen from the retina can migrate toward the lens because the replacement fluid used to replace the vitreous gel doesn't prevent that movement the way the natural gel does.

"It seems one of the important functions of the vitreous gel is to keep oxygen away from the lens," Holekamp said. "When we remove the gel, we remove that protective mechanism."

Even after the vitreous gel has been removed, Holekamp said it may be possible to lower the amount of oxygen near the lens by lowering the oxygen level in the fluid that is pumped into the eye.

"We're proposing that we deoxygenate the fluid used to replace the vitreous gel," she said. "There's no good reason to infuse such a highly oxygenated fluid into the eye. If we want to perform surgery under more natural conditions, we should remove the oxygen from that fluid."

> "It's fairly well-accepted in the field that anyone over 50 who has vitrectomy surgery will develop a cataract within two years. But if we could understand this process and prevent it, patients would be better off."
>
> NANCY M. HOLEKAMP

A co-investigator, David C. Beebe, Ph.D., the Janet and Bernard Becker Professor of Ophthalmology and Visual Sciences and professor of cell biology and physiology, believes the same kind of mechanism may contribute to cataracts that form as people age.

The difference is that in age-related cataracts, the gel breaks down over several years. In vitrectomy patients, the gel disappears all at once.

Beebe and his colleague Ying-Bo Shui, M.D., Ph.D., a staff scientist in ophthalmology, have demonstrated a statistical relationship between breakdown of the vitreous gel and the risk for cataracts.

They believe that when the gel separates from the retina or begins to break down and liquefy, it allows fluid to flow over the surface of the oxygen-rich retina and carry that oxygen to the lens.

That's true whether a person's vitreous has begun to liquefy with age — a process known as vitreous liquefaction — or the vitreous gel has been removed in retinal surgery patients.

Beebe plans to conduct animal studies to see if he can prevent oxygen from reaching the lens.

"If we can remove or reduce the amount of molecular oxygen that reaches the lens, and that turns out to protect against nuclear cataracts in either human patients or in animals, I think it will make a very strong case for oxygen being the culprit," he said.

Beebe, Holekamp and Ying-Bo Shui are launching a Clinical Cataract Research Center in the School of Medicine. They plan to study both the cataracts that form rapidly in vitrectomy patients and, in future studies, to look at drugs that may slow the onset or progression of cataracts.

CLAUDIA BURRIS

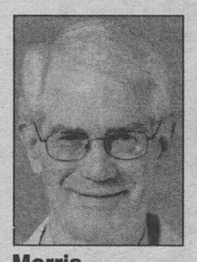
Positive interaction Second-year medical students Yamini Virkud (left) and Brian Miller get to know Koong-Nah Chung, Ph.D., instructor of cell biology and physiology, at the Lowry-Moore Society event at the Jewel Box in Forest Park April 7. The Lowry-Moore Society is one of three academic societies in the School of Medicine that promotes interaction between faculty and students. More than 60 faculty members and students attended the spring social event.

Morris receives prize for Alzheimer's research

BY MICHAEL C. PURDY

The American Academy of Neurology has awarded the 2005 Potamkin Prize for Research in Pick's, Alzheimer's and Related Diseases to John C. Morris, M.D., the Friedman Distinguished Professor of Neurology and director of the Alzheimer's Disease Research Center (ADRC) in the School of Medicine.

The annual prize honors scientists for outstanding contributions to the understanding and treatment of Alzheimer's disease and related disorders. It is regarded as the most prestigious prize in Alzheimer's research.



Morris

Ronald Petersen, M.D., Ph.D., of the Alzheimer's Disease Research Center at the Mayo Clinic College of Medicine, also was awarded the prize this year. Morris and Petersen were recognized for their pioneering efforts in early diagnosis of Alzheimer's disease.

Earlier this year, Morris received another prestigious research prize, the MetLife Foundation Award for Medical Research in Alzheimer's Disease.

Among other accomplishments, Morris' research team refined the Clinical Dementia Rating (CDR) system, which was first developed by the founding director of the ADRC, Leonard Berg, M.D., professor emeritus of neurology.

The CDR is now the standard clinical measure for the staging of dementia. Morris' studies have helped clinicians better distinguish between the normal effects of aging on memory and the earliest clinical symptoms of Alzheimer's disease.

The impetus to find ways to diagnose Alzheimer's disease earlier stems from a growing awareness of the extent of Alzheimer's brain damage prior to clinical symptoms. Morris, Joseph L. Price, Ph.D., professor of anatomy and neurobiology, and others at the ADRC contributed significantly to this awareness through a series of studies that revealed widespread brain damage in patients only recently diagnosed with Alzheimer's.

> "First, it indicates that we have a very talented, productive and innovative group of investigators. Second, these awards reflect the environment in which we work, in terms of our terrific staff and the dedicated volunteers who participate in our studies."
>
> JOHN C. MORRIS

"Our studies illustrate why I accept individual prizes on behalf of the entire ADRC, because they truly represent the group effort of many wonderful colleagues," Morris said.

Morris is the third researcher affiliated with the ADRC to receive the Potamkin prize. Previous University recipients are Alison M. Goate, D.Phil., the Samuel and Mae S. Ludwig Professor of Genetics in Psychiatry, professor of genetics and of neurology; and David M. Holtzman, M.D., the Andrew B. and Gretchen P. Jones Professor, the Charlotte and Paul Hagemann Professor and head of the Department of Neurology.

According to Morris, this record reflects the extraordinary nature of the ADRC, which celebrates its 20th anniversary this year.

"First, it indicates that we have a very talented, productive and innovative group of investigators," he said. "Second, these awards reflect the environment in which we work, in terms of our terrific staff and the dedicated volunteers who participate in our studies."

With current studies using new brain-imaging agents and other advanced techniques, Morris and his colleagues soon hope to diagnose Alzheimer's disease well before the onset of symptoms.

According to Morris, over the past 10 years, five drugs have been approved by the Food and Drug Administration for treatment of the symptoms of Alzheimer's disease.

"In the next 10 years, I predict that we'll be evaluating interventions that not only help the symptoms but also target the underlying factors that cause illness," he said.

"These treatments will have their optimal benefit when they are introduced at the earliest possible stage of Alzheimer's, perhaps even offering hope of preventing the disorder."

Diabetes Research and Training Center provides grant funding

The Diabetes Research and Training Center in the School of Medicine is offering grant funding to faculty members who conduct research in diabetes and endocrinology.

Applicants from the basic sciences, epidemiological and behavioral science departments are especially encouraged to apply.

Researchers at the Hilltop Campus are also eligible to apply for funding, which will begin Dec. 1.

The grants range from $20,000 to $50,000 annually and run for a two-year period, based on an approved progress report.

The center's pilot and feasibility program fosters projects required to develop preliminary data, which could lead to independent research supported by the National Institutes of Health.

Applicants must submit letters of intent to the Diabetes Research and Training Center by June 10; proposals are due Aug. 12. Both should be sent to Sherry Ellis at Campus Box 8127.

For more information and application forms, call 362-7754.

Race for the Cure with Siteman

BY KIM LEYDIG

Last year, more than 50,000 people participated in the Komen St. Louis Race for the Cure — raising more than $1.2 million for breast cancer education, screening, treatment and support programs in the metro area.

And you can help increase this year's numbers by joining the Siteman Cancer Center race team.

The seventh annual Komen St. Louis Race for the Cure will be held June 18 in downtown St. Louis. Participants can select one of several race options, including a competitive 5K run, a noncompetitive 5K run/walk or a fun run.

During last year's race, the Siteman Cancer Center fielded the race's third-largest team. Those who join the Siteman team this year will receive Komen and Siteman T-shirts, along with the chance to win prizes like $500 or round-trip airline tickets.

To sign up as a Siteman team member, visit the Komen St. Louis Web site at *komenstlouis.org* — and select team No. 1952 — by May 31.

Applicants can also request entry forms by calling 747-7222 or (800) 600-3606. The registration fee is $20.

Race packets for team members will be available for pickup in the Center for Advanced Medicine the week of June 13.

Conservation offers another alternative to recycling

BY ANDY CLENDENNEN

Gas prices are soaring. Natural resources are diminishing. The costs of energy are increasing every day.

While recycling can certainly help — it's always better to fill the blue bins with unwanted paper than it is to throw that paper into the trash — there's another, lesser-known way of keeping costs down while preserving resources at the same time.

Conservation.

Conservation could be considered a precursor to recycling — the more you conserve, the less you have to recycle. And there are several ways to practice conservation in your office and home in two of the most important areas — light and water.

"The benefits to conservation are twofold," said Bruce Backus, assistant vice chancellor for environmental health and safety. "There are both economic and environmental benefits to conserving materials.

"From an economic standpoint, simple common-sense use of lighting and water can save thousands of dollars a year. And conserving more energy, paper and water also leads to less waste that sometimes gets distributed into the environment."

Perhaps the biggest way to save money and energy involves lighting. A quick rundown of a checklist shows several very simple — and in some cases, obvious — ways to conserve:

- Turn off all lights not in use;
- Use bulbs of lower wattage;
- Use natural sunlight when possible;
- Keep bulbs and fixtures clean;
- Focus light on your task; and
- Use fluorescent lights wherever possible.

Fluorescent lights use about 25 percent as much energy as normal lights and can last 10 times longer, saving energy and replacement labor.

Adding occupancy sensors can help. In rooms that are not occupied constantly, such as conference rooms, lunchrooms and bathrooms, sensors will automatically turn lights on when people enter the room and off after they leave. Lighting accounts for 40 percent of energy used in office buildings.

Regarding water, a way to avoid waste is to never put water down the drain when there may be another use for it such as watering a plant or garden, or cleaning. When washing dishes, fill the sink and let the dishes soak before rinsing, instead of using constantly running water.

Heating and cooling is another area prone to wasted resources. Some easy pitfalls and their solutions include using natural ventilation or fans for air circulation and cooling needs; using window-shading devices and placing work stations away from direct sunlight in the heat of the summer; setting the thermostat at 68 degrees Fahrenheit or lower in the winter and 78 degrees Fahrenheit or above in the summer.

Perhaps most important is to keep the heating and cooling to a minimum. Heating and cooling accounts for half of the total energy use in office buildings.

Finally, a third big way to save energy is through judicious use of electricity. You know that computer you leave on every night? Turn it off.

If you can't turn it off every night because of system backups or upgrades, talk with your administrator to find nights when you can shut the machine off. Weekends are especially important.

When replacing computers, purchase the new energy-efficient types that use up to 90 percent less energy.

An energy conservation Web site uses the example of Cole & Weber, an advertising agency in Seattle with about 30 workers. The workers turn their computers off at night and during weekends, which saves $3,000 in energy costs a year — enough to pay for a new computer.

However, sometimes there is no alternative but to recycle.

Before recycling your office paper, make sure you fully used it. Print draft documents on the back side of no-longer-needed documents. Use the duplex feature on photocopiers, making copies on the front and back sides of paper.

Use the designated bins on the campuses to recycle paper, aluminum cans and other materials, and do not contaminate those waste streams with other trash.

Also, the University's environmental health and safety (EHS) office will help recycle several items that people might not think are reusable. Some of these are considered "mandatory waste disposal" items that must be handled through the EHS office.

The items include:

- Freon and oils from white goods, such as refrigerators, air conditioners and vacuum pumps;
- Hazardous metals from electronic equipment containing printed circuit boards/computers and computer monitors;
- Hazardous metals such as lithium, mercury, silver, nickel, cadmium and lead from many specialty batteries; and
- Mercury, lead, phosphor, glass and aluminum from fluorescent lamps.

For more information, go online to *ehs.wustl.edu*.

For a complete list of materials that can be recycled, including used office furniture, or other hazardous materials that EHS will dispose of, go online to *ehs.wustl.edu/hazmats/hazwaste.htm*.

University Events

Bone Marrow Drive • The Passing Zone • Foundations of Business Strategy

"University Events" lists a portion of the activities taking place May 6-19 at Washington University. Visit the Web for expanded calendars for the Hilltop Campus (calendar.wustl.edu) and the School of Medicine (medschool.wustl.edu/calendars.html).

Exhibits

Wednesday, May 11

Bachelor of Fine Arts Student Show. Through May 20. Kemper Art Museum. 935-4523.

Lectures

Friday, May 6

Noon. Cell Biology & Physiology Seminar. "Dynamic Imaging of ECM Assembly and Avian Embryogenesis." Brenda J. Rongish, asst. prof. of anatomy & cell biology. McDonnell Medical Sciences Bldg., Rm. 426. 362-2254.

12:30-4 p.m. St. Louis STD/HIV Prevention Training Center CME Course. "STD Update." Cost: $75. U. of Mo.-St. Louis, South Computer Bldg., Rm. 200A. To register: 747-1522.

2-4 p.m. Academic Publishing Services Workshop. "Strategies for Manuscript Publishing: Creating Figures, Tables, and References, and Considering Copyright and Ethics." Cost: $50 for faculty & staff, $35 for fellows, residents, postdocs & students. Cori Aud., 4565 McKinley Ave. To register: 747-4656.

3 p.m. Physics & Center for Materials Innovation Seminar. "Mechanisms and Effects of Microbial Metal Reduction." Tyrone L. Daulton, dir., marine geosciences — electron microscopy facility, Stennis Space Center, Miss. (2:45 p.m. coffee.) Compton Hall, Rm. 241. 935-9305.

Saturday, May 7

7 a.m.-noon. Allergy & Immunology CME Course. "Asthma in the Inner City and Suburbia." Cost: $95 for physicians, $75 for allied health professionals. Eric P. Newman Education Center. To register: 362-6891.

7:30 a.m.-3:45 p.m. Cardiothoracic Surgery CME Course. "Recent Advances in the Management of Valvular Heart Disease." Cost: $35. The Ritz-Carlton, 100 Carondelet Plaza. To register: 362-6891.

Monday, May 9

Noon. Neurology Monday Noon Seminar Series. Hope Center Prize Presentations. "Novel Insights Into the Mechanism of Neurodegeneration in Menkes Disease: Copper-dependent Excitotoxic Neuroprotection." Michelle Schlief, graduate student in pediatrics, in genetics & genomics and in medicine; "Activation of C-Jun N-terminal Kinase Decreases Proteasome Activity." Shengzhou Wu, postdoctoral research scholar in neurology. Maternity Bldg., Schwarz Aud. 747-3243.

5-8 p.m. Center for the Application of Information Technology Four-Evening Workshop. "Business Finance & Budget Fundamentals for IT Professionals." (Continues 5-8 p.m. May 11, 16, and 18.) Cost: $820, reduced fees available for CAIT member organizations. CAIT, 5 N. Jackson Ave. 935-4444.

Tuesday, May 10

12:30 p.m. Molecular Microbiology & Microbial Pathogenesis Seminar Series. "Development and Testing of the Na-ASP-2 Hookworm Vaccine." Peter Hotez, prof. & chair of microbiology & tropical medicine, George Washington U. McDonnell Medical Sciences Bldg., Erlanger Aud. 286-2887.

Wednesday, May 11

4 p.m. Biochemistry & Molecular Biophysics Seminar. "Control of Sugar Kinase/hsp70/actin Superfamily Catalysis: Does Coupling of a Distal Allosteric Binding Site to the Conserved ATPase Core Involve Tuning of a Back-bone Motion?" Donald W. Pettigrew, prof. of biochemistry & biophysics, Texas A&M U. Cori Aud., 4565 McKinley Ave. 362-0261.

How to submit 'University Events'

Submit "University Events" items to Genevieve Podleski of the *Record* staff via:

(1) **e-mail** — recordcalendar@wustl.edu;

(2) **campus mail** — Campus Box 1070; or

(3) **fax** — 935-4259.

Deadline for submissions is noon on the Thursday eight days prior to the publication date.

Thursday, May 12

7:30-11:30 a.m. Center for the Application of Information Technology Course. "Security Awareness Roundtable." Cost: $2,800 group rate for 7 half-day sessions, reduced fees available for CAIT member organizations. For information and to register: 935-4444.

Friday, May 13

9 a.m.-5 p.m. Olin School of Business Conference. "Foundations of Business Strategy." (Continues 9 a.m.-noon May 14.) Knight Center. 935-7768.

Noon. Cell Biology & Physiology Seminar. "Hematopoietic Stem Cells: Regulation by Novel Surface Proteins." Harvey Lodish, dept. of biology, Whitehead Inst., Mass. Inst. of Technology. McDonnell Medical Sciences Bldg., Rm. 426. 362-7449.

2-4 p.m. Academic Publishing Services Workshop. "Strategies for Manuscript Publishing: Understanding How Manuscripts are Reviewed." Cost: $50 for faculty & staff, $35 for fellows, residents, postdocs & students. Cori Aud., 4565 McKinley Ave. To register: 747-4656.

Monday, May 16

Noon. Molecular Biology & Pharmacology Seminar. "Regulating Synaptic Size and Strength." Aaron DiAntonio, asst. prof. of molecular biology & pharmacology. South Bldg., Rm. 3907, Philip Needleman Library. 362-0183.

Noon. Neurology Monday Noon Seminar Series. Jin-Moo Lee, asst. prof. of neurology. Maternity Bldg., Schwarz Aud. 747-3243.

Tuesday, May 17

Noon. Program in Physical Therapy Research Seminar. 4444 Forest Park Blvd., Lower Lvl., Rm. B108/B109. 286-1404.

12:30 p.m. Molecular Microbiology & Microbial Pathogenesis Seminar Series. "Genetic Control by Complex Riboswitches." Ronald Breaker, prof. of molecular, cellular, and developmental biology, Yale U. McDonnell Medical Sciences Bldg., Erlanger Aud. 286-2912.

Wednesday, May 18

7 a.m.-7:45 p.m. Internal Medicine CME Course. "Washington Manual Comprehensive Internal Medicine and Board Review Course." (Continues 7:30 a.m.-7:30 p.m. May 19.) Cost: $975 for physicians, $775 for residents, fellows, and allied health professionals. Eric P. Newman Education Center. For more information and to register: 362-6891.

7:30-11:30 a.m. Center for the Application of Information Technology Course. "Project Management Roundtable." Cost: $1,995 group rate for 7 half-day sessions, reduced fees available for CAIT member organizations. For information and to register: 935-4444.

Thursday, May 19

2-4 p.m. Academic Publishing Services Workshop. "Strategies for Manuscript Publishing: Assuming Roles in the Review Process." Cost: $50 for faculty & staff, $35 for fellows, residents, postdocs & students. McDonnell Medical Sciences Bldg., Erlanger Aud. To register: 747-4656.

On Stage

Friday, May 6

8 p.m. OVATIONS! Series. The Passing Zone. (Also 8 p.m. May 7.) Cost: $28, $24 for seniors & WUSTL faculty & staff, $18 for students and children. Edison Theatre. 935-6543.

Sports

Saturday, May 7

Noon. Softball vs. McKendree College. WUSTL Field. 935-4705.

And more...

Friday, May 6

5-7 p.m. Kranzberg Illustrated Book Studio Annual Open House. West Campus, Kranzberg Illustrated Book Studio. 935-5495.

Monday, May 16

11 a.m-3 p.m. Bone Marrow Drive. Sponsored by the program in audiology and communication sciences. Central Institute for the Deaf gymnasium, 4560 Clayton Ave. For information and to register: 747-0104.

PEN

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"The program brings together bioengineers, materials scientists, biologists and physicians who will work in interdisciplinary teams," Nabel said. "By taking advantage of the unique properties of materials at the nanoscale, these teams will devise creative solutions to medical problems."

Wooley, a synthetic organic chemist who has made numerous important breakthroughs with nanoparticles over the past decade, cited six specific aims of the program:

(1) Preparation and assembly of programmed, integrated nanosystems;

(2) Application of nanostructures for imaging at increased levels of sensitivity;

(3) Imaging of gene expression by recognition of messenger RNA (mRNA) transcription products;

(4) Application of the nanostructures for therapy;

(5) Cross-disciplinary education and training of medical and materials scientists; and

(6) Dissemination and translation of nanotechnology developments.

As an example of how people in the PEN will collaborate and rely on each other's skills, Wooley said to imagine an injured blood vessel in the lung or cardiovasculature as the target.

With guidance provided by medical experts on these diseases, nanoparticles that Wooley and her lab members have been making for years called "shell cross-linked nanoparticles" or other nanoscale materials being developed in other laboratories will be used as carriers for diagnostic imaging agents and therapeutics.

Add a protective agent and then a permeation peptide that allows entry into cells, and the nanomaterial becomes more sophisticated.

Incorporated into the nanoparticle will be a chelater that will hold onto copper 64, enabling collaborator Michael J. Welch, Ph.D., professor of radiology in the School of Medicine, to image the injured tissue with positron emission tomography (PET). Once the nanoparticles concentrate at the injury site, they will light up under PET imaging.

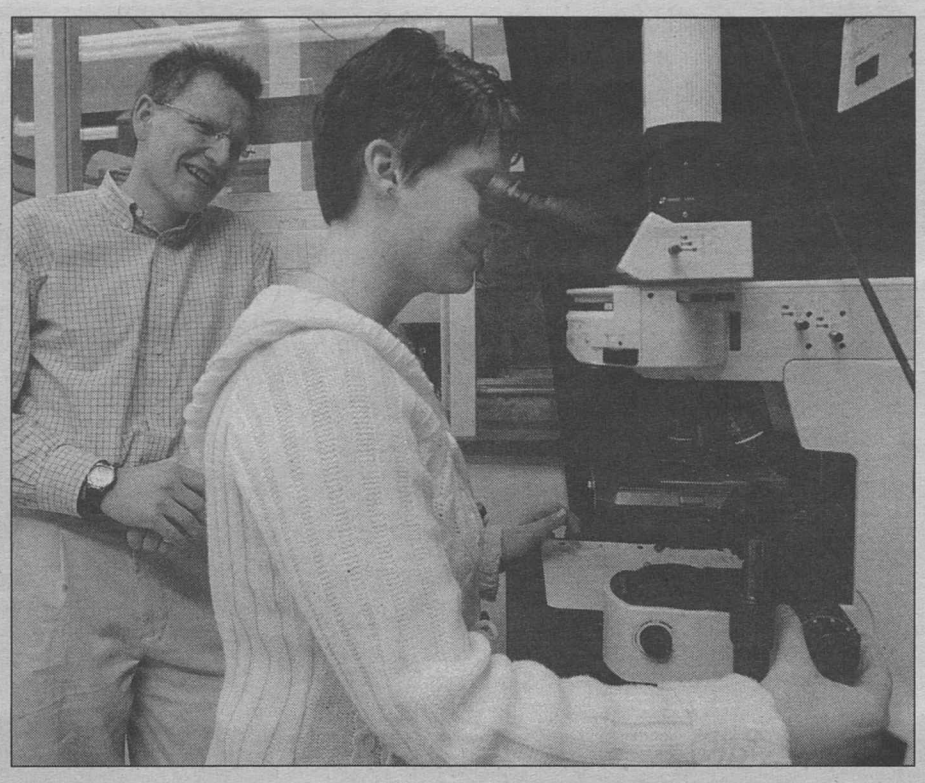
But how do the nanoparticles know how to find the specific tissue? Enter John-Stephen Taylor, Ph.D., professor of chemistry, a synthetic organic chemist who identifies a genetic sequence made by the over-expression of mRNA, a hallmark of tumor cells. Taylor can make a sequence that binds to the cancerous mRNA, making a docking site for the nanoparticles.

PEN collaborators Jean Frechet, Ph.D., of the University of California, Berkeley, and Craig Hawker, Ph.D., of the University of California, Santa Barbara, are working on a function that will trigger a breakdown of the nanoparticles after they deliver their payload — a drug or antiviral agent, for instance.

Wooley and her collaborators have been able to make this nanosystem work in vivo, targeting cancer cells. One prime goal is to use it to image gene therapy.

This is just one of many applications that Wooley and her collaborators believe will come out of the research performed in the program, with emphasis, ultimately, on translation to treat pulmonary and acute vascular inflammation and injury in humans.

"We're excited by the many possibilities collaboration such as this affords, and gratified that the NHLBI has chosen us," Wooley said. "We are going to make sure that this technology is learned, shared, improved and disseminated through publications and presentations nationwide."



DAVID KILPER

Lars Angenent guides graduate student Rebecca Hoffman as she examines bacteria from air digesters under a high-powered epifluoresence microscope. Angenent led a team of researchers in applying a molecular approach to identify the biological particles in aerosol responsible for making employees of a Colorado hospital therapeutic pool ill.

Researchers use molecular approach to identify pool's bacterial pathogen

BY TONY FITZPATRICK

A team of researchers led by a WUSTL engineer has applied a molecular approach to identify the biological particles in aerosol responsible for making employees of a Colorado hospital's therapeutic pool ill.

They found that when a bubble bursts, the bacteria disperse, and lifeguards get pneumonia-like symptoms.

Lars Angenent, Ph.D., assistant professor of chemical engineering, and collaborators from San Diego State University and the University of Colorado took what is known as a molecular survey of a common gene found in all life forms, 16 S ribosomal RNA (rRNA) gene, by cloning the different forms, sequencing them and making evolutionary-distance trees, or phylogenetic trees.

They then were able to match the genetic sequence of the bacterium *Mycobacterium avium* to the same bacterium found in the lungs of nine lifeguards who had become ill with hypersensitivity pneumonitis, a lung condition that mimics pneumonia symptoms.

The therapeutic pool was unlike regular swimming pools — but similar to hot tubs — in that the water temperature is about 92-94 degrees Fahrenheit. The pool water was treated with hydrogen peroxide, rather than chlorine, as a disinfectant.

Patients who take hydrotherapy can be in the pool for up to four hours, and skin is sensitive to chlorine when exposed to it that long.

Lifeguards became ill because they were exposed to the bacteria in aerosols eight hours daily, five days a week. No patients became ill at the hospital, which must remain anonymous.

"The presence of *Mycobacterium avium* would be a concern for the very young or old or immunocompromised," Angenent said. "This isn't a concern for a regular swimming pool, so there shouldn't be any reason to panic."

Angenent said that typically bioaerosol researchers examining a problem like this would sample the air, capture the cells and grow them on an agar plate and count colonies of species, but this approach misses too many airborne bacteria, which are difficult to grow in a laboratory environment.

The approach he and his collaborators took enabled them to survey more than 1,300 rRNA genes from the different bacteria and fungi found in the air and pool water, giving them a total of 628 unique sequences, the most common being *Mycobacterium avium*, which was found in the ill people's lungs.

"Our results show that molecular surveys are much better tools to gain knowledge of pathogens in the environment compared with conventional approaches," Angenent said. "If you use conventional tools, you might think there is no problem when there really is one."

The study was published in the March issue of the *Proceedings of the National Academy of Sciences*.

Burst your bubble

The preferred site for these bacteria in the watery environment is a water bubble because the species is hydrophobic. They prefer to cluster together near the air and avoid the water.

The pool had many bubbles in it because of the addition of hydrogen peroxide. Whenever the bubble bursts, bacteria can become airborne.

Mycobacterium avium is a gram-positive bacterium, known to be resistant to disinfection in large part because of a strong, waxy cell wall. In this particular hospital environment, the bacteria had even more freedom to grow because the hydrogen peroxide killed off nearly all its competitors.

"We did an exhaustive survey of everything we could find in the water and air, both at the pool and outside the pool environment," Angenent said. "We wanted to be sure the troublesome aerosol came from the pool and not from outside.

"We did find this mycobacterium at incredibly high levels in air, but we also found fungi spores and plant materials."

While no immunocompromised patients using the hospital pool became ill, there are documented cases of the immunocompromised becoming ill from *Mycobacterium avium*, Angenent said.

"The pool was closed down for a short while, then re-opened," he said. "There were no reported cases of anyone else becoming ill from exposure, and the pool would have been safe for healthy people, as long as they were not in the environment for long stretches of time."

Angenent said he has results from a related study that shows air filters he and his co-workers placed by the same pool captured and removed a large percentage of bacteria from air. The pool has now reopened and no new cases of illness have been seen.

Sports

Tennis teams head to NCAA tourney

The men's and women's tennis teams are headed to the NCAA Tournament for the sixth-consecutive season, as announced by the NCAA Division III tennis committee.

The No. 16th women's team travels to Denison University for the Central Regional on May 7-8. WUSTL (9-8) takes on No. 6 DePauw University on May 7, while No. 8 Denison hosts No. 29 Albion College in the other first-round match-up. The winners meet the next day with a chance to advance to the NCAA quarterfinals.

The No. 17th men's team will travel to DePauw University for the NCAA Central Regional, also slated for May 7-8. The Bears will play No. 10 Kalamazoo College in the first round. No. 8 DePauw, the host school, and No. 23 Kenyon College will face off in the other match. The winners will meet the next day to decide which team will advance to the national quarterfinals.

Baseball sweeps to win 30th game

The baseball team swept Illinois College, 4-2 and 9-3, on May 1 to improve to 30-7. The 30 wins for the Red and Green tie the school record for a single season.

In Game 1, the Bears took control of the contest in the fourth inning. Junior Ryan Corning sparked the run with a one-out double. Senior Dan Rieck walked and sophomore Andy Shields followed with a single. Junior Alan Germano smacked a two-RBI double to give WUSTL the lead for good. Germano finished 2 for 3 with two RBIs. Junior Bryan Brown grounded out to first to plate Shields, and Germano scored on an errant throw by Illinois College's second baseman for a 4-0 edge. Sophomore Brent Buffa pitched a complete game for his team-leading 10th win of the season.

In the second game, the Bears led 2-1 heading into the third before tallying some insurance runs. Germano struck first with a one-out solo home run over the left field fence. When it was over, the Bears scored four third-inning runs to take a commanding 6-1 lead.

No. 1 softball team runs record to 45-1

The top-ranked softball team wrapped up its regular season with a perfect 4-0 record last week to improve to 45-1 overall. WUSTL swept doubleheaders from Webster University on April 27 and the University of Chicago on April 30.

The Bears had 12 hits, including two home runs, in the 7-1 win in Game 1 against Webster. They followed that up with four home runs in a 9-1 win in five innings in the nightcap.

In Game 1, sophomore Laurel Sagartz allowed two hits and struck out nine as she improved to 21-1. She also went 3 for 4 with two RBIs.

In Game 2, the Bears built an early 2-0 lead in the first and never looked back as they had 10 hits in the victory. Senior Victoria Ramsey picked up her 50th career victory by allowing six hits and striking out six. Ramsey is now 14-0 on the season and 50-13 for her career.

In the sweep against Chicago, Sagartz pitched a 1-0 shutout in Game 1, and Ramsey followed suit with a 2-0 shutout in Game 2. Sagartz struck out nine and walked none as she improved to 22-1 on the mound.

Ramsey (15-0) allowed four hits and struck out seven in game two as she posted the Bears' 24th shutout of the season.

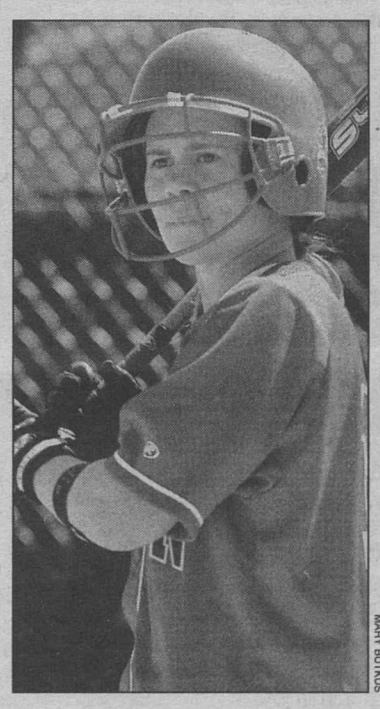
Track and field teams shine at Drake Relays

The men's and women's track and field teams made their marks at the storied Drake Relays April 29-30 in Des Moines, Iowa.

The women's 4x400-meter relay squad provided the highlight for the Red and Green, recording the fastest time to date in NCAA Division III during the outdoor season. The quartet of freshman Danielle Wadlington, sophomore Natalie Badowski, junior Laura Ehret and junior Michelle McCully clocked a school-record time of 3:50.03, eclipsing the previous record by nearly two seconds.

On the men's side, freshman Doug Beattie, junior David Skiba, senior Lance Moen and junior Jimmy Centella finished 10th in the sprint medley. In a field of 24, the Bears' time of 3:30.50 finished just six seconds off the winning time.

Skiba placed 23rd in the 400-meter hurdles, clocking a time of 54.99, while the 4x400 relay team of Beattie, Moen, Skiba and freshman Marcus Woods placed 24th in 3:21.92.



MARY BUTKUS

Freshman outfielder Amy Vukovich leads the Bears and is second in the UAA with a .451 average, has an on-base percentage of .517 and has stolen 12 bases in 13 attempts. The 45-1 Bears are hitting .351 as a team, nearly 200 points higher than their opponents, who are a collective .155 against WUSTL.

On the Web

For complete sports schedules and results, go to **bearsports.wustl.edu**.

Hungry? Dining services unveils summer changes

BY ANDY CLENDENNEN

Although there will be fewer faculty and students on the Hilltop Campus over the summer, there will still be several places for people to grab a bite to eat.

However, some of the available hours have changed, and other places will be closed completely, or for part of the summer.

First of all, Holmes Lounge will be closed for the summer, starting May 16.

The Kosher Cart in Mallinckrodt Student Center is planning to close permanently — the last day of operation will be May 6.

Because kosher items have been added to most dining locations, the need for the cart in Mallinckrodt has diminished, according to Paul Schimmele, assistant to the director of operations.

Also, Wohl Student Center will be undergoing significant plumbing upgrades, which will result in a shutdown of water and dining services from May 24-June 3.

"Because of renovations in Wohl Center, the Mallinckrodt Food Court will be offering all the usual summer items," Schimmele said.

"That will include a wrap station, philly station, pasta, pizza, soup, salad bar, and a carvery selection."

Because of the renovations at Wohl Center, breakfast and dinner will be now be included at Mallinckrodt, as well as a "Holmes-style" carvery station, Schimmele said.

Several new options will be available at the Hilltop Bakery during the summer, including soups, sandwiches, casseroles and hot dogs.

"When the (Mallinckrodt) Food Court returns to normal summer operation after the Wohl renovation, it will offer its normal lunch fare as listed above," Schimmele said.

For more information, go online to *diningservices.wustl.edu*.

Summer hours for Hilltop Campus dining

Bear's Den
Beginning June 6:
- M-F: 8:30 a.m.-8 p.m.
- Sat & Sun: 9 a.m.-7 p.m.

Mallinckrodt Food Court
May 24-June 5:
- M-F: 8:30 a.m.-8 p.m.
- Sat & Sun: 9 a.m.-7 p.m.

Beginning June 6:
- M-F: 11 a.m.-3 p.m.
- Sat & Sun: Closed

Subway
Beginning May 11:
- M-F: 11 a.m.-3 p.m.

Hilltop Bakery
Beginning May 12:
- M-F: 8 a.m.-3 p.m.
- Sat & Sun: Closed

Whispers Café
Beginning May 12:
- M-F: 11 a.m.-3:30 p.m.
- Sat: 8:30 a.m.-6 p.m.
- Sun: Closed

AAAS

Schofield has written several books & papers

– from Page 1

nique to capture details of the molecular mechanisms that underlie many basic biological activities, including nerve cell signal-transmission, muscle contraction, and most recently, the fusion of viruses with cells during the spread of infection.

He compares quick-freeze deep-etch electron microscopy to using a stroboscopic flash to freeze the action in a photograph.

"Like a strobe, it stops the biological event in midstream, freezing it in roughly one ten-thousandth of a second," he said.

To make it possible to image the frozen sample with an electron microscope, Heuser adds an ultra-thin film of metallic platinum that molds snugly against the sample's frozen surface contours.

He and others in his lab have worked to make the equipment and procedures necessary for this process available to researchers around the world. Heuser has patents pending on the University's behalf for even more-advanced versions of his quick-freezing machines.

Heuser graduated magna cum laude from Harvard Medical School in 1969 and joined the Washington University faculty as a professor of biophysics in 1980. He is associate editor of the *Journal of Neurocytology* and previously served as associate editor of the *Journal of Cell Biology*.

Roediger is internationally recognized for his research on human learning and memory, especially for studies exploring how knowledge is recovered from memory. He is author of three books, has edited four others and has published about 170 articles and chapters.

He joined WUSTL in 1996 and served as chair of the Department of Psychology in Arts & Sciences until 2004, when he was named dean of academic planning in Arts & Sciences.

He earned a doctorate in psychology from Yale University in 1973 and taught for many years at Purdue University, the University of Toronto and Rice University.

Roediger is past president of the American Psychological Society, the leading organization of academic psychologists in the United States, and a former chair of the Society of Experimental Psychologists. He has served as president of the Midwestern Psychological Association and chair of the Governing Board of the Psychonomic Society.

Roediger has also been elected a fellow of the American Association for the Advancement of Science, as well as three psychological organizations.

A study in the mid-1990s by the Institute of Scientific Information (ISI) showed that Roediger's work for the five-year period from 1990-94 had the greatest impact of any researcher in the field of psychology. In 2003, the ISI named Roediger a "Highly Cited Researcher" in a new study.

Schofield, a member of the faculty here since 1986, is a professor of economics and of political science, both in Arts & Sciences.

His teaching and research interests include the theory of social choice, comparative politics, constitutional political theory, political economy, international politics and economics.

A native of Scotland, Schofield earned doctorates in government and in economics from Essex University; a doctor of letters from Liverpool University; and a doctorat d'etat en sciences economiques from the University of Caen.

He has held academic positions at California Institute of Technology and the universities of Essex, Manchester, Yale, Stanford and Texas.

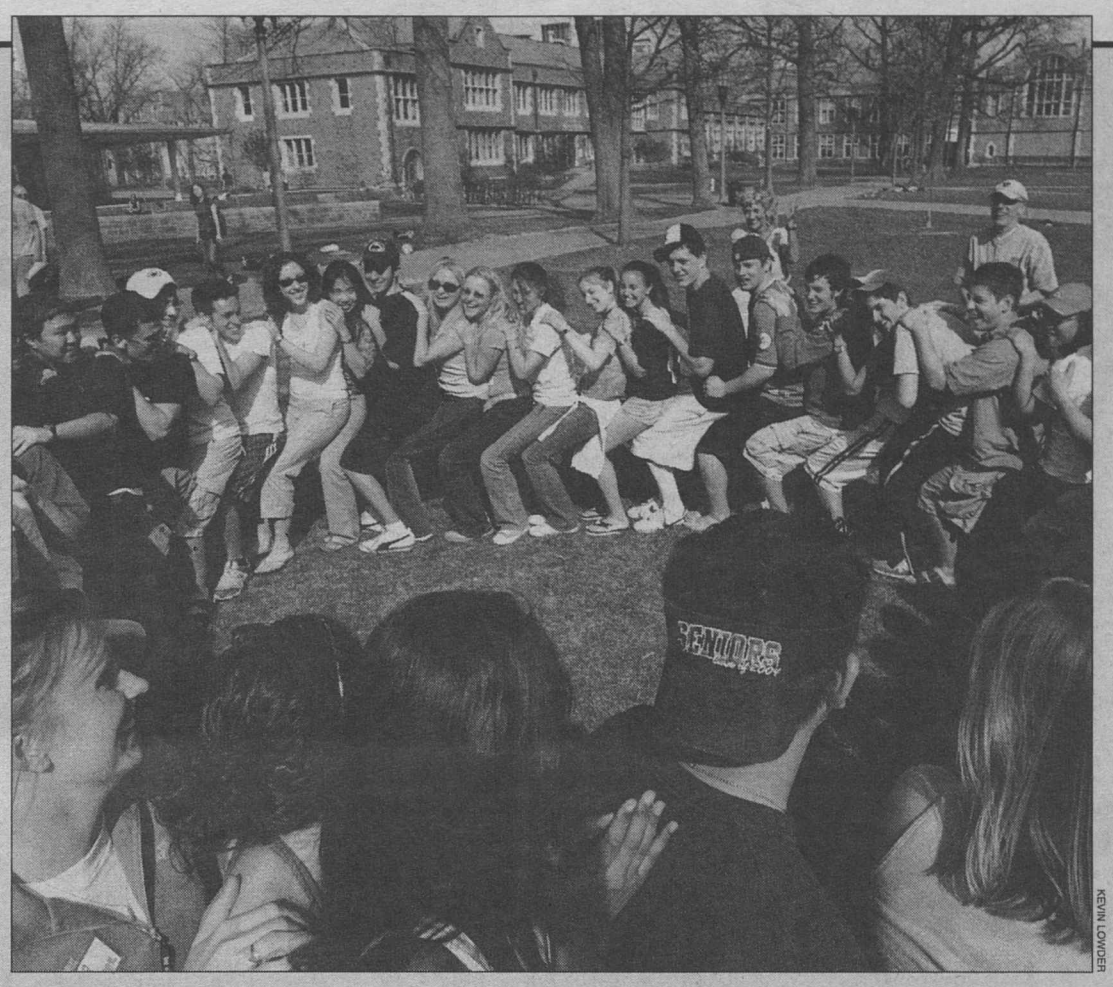
Much of his research is supported by National Science Foundation grants.

His publications in democratic theory include articles in the *Journal of Theoretical Politics*, the *European Journal of Political Research*, *Mathematical Computer Modeling*, the *American Political Science Review* and *Social Choice and Welfare*, for which he serves on the editorial board.

He has written several books, including *Multiparty Governments* (with Michael Laver in 1990) and *Social Choice and Democracy* (1985). His most recent work is *Mathematical Models in Economics and Social Choice* (2003).

He has two books forthcoming: *Multiparty Democracy* (with Itai Sened) and *Constitutional Quandaries*.

He has co-edited three volumes: *Political Economy: Institutions, Information, and Representation* (1993), *Social Choice, Welfare and Ethics* (1995) and *Collective Decision Making* (1996).



KEVIN LOWDER

Trust me! **A group of fraternity and sorority pledges participate in a recent trust-building game on the lawn outside Olin Library. More than 450 students attended the team-building event, facilitated by the YMCA of the Ozarks and sponsored by the Office of Greek Life.**

Therapy

Researchers worked with newborn animals

– from Page 1

For their own safety, hemophiliacs must be near a refrigerated supply of clotting factor at all times. Over the long term, hemophiliacs suffer from joint damage and other complications related to excess bleeding.

Gene therapy for hemophilia A has been especially challenging because the gene for factor VIII is quite large and therefore hard to fit into viral vectors, which serve as the gene delivery vehicle. The researchers eliminated parts of the factor VIII gene and other genetic components to minimize the material needed and used a large viral vector called gamma retroviral vector.

The viral vector carrying factor VIII genes was injected into the blood of 11 newborn hemophilic mice and two newborn hemophilic dogs. The viral vector also contained a short DNA promoter sequence to make the gene active only in liver cells, one of the sites of factor VIII production in non-hemophiliacs.

The normal mechanisms of viral reproduction enabled insertion of the genetic material from the engineered vectors into cells in the animals.

After treatment, blood tests demonstrated all of the treated animals were producing factor VIII. The mice achieved an average of 139 percent of normal factor VIII activity, and the dogs an average of 115 percent of normal factor VIII activity in a blood-clotting assay.

This activity level has remained stable for 1.5 years. In comparison, untreated animals with hemophilia A have less than 1 percent normal factor VIII activity.

"This level of expression of factor VIII in dogs is especially interesting, because in other attempts the results in large animals have not been successful," Ponder said.

The researchers worked with newborn animals for two reasons.

First, their livers are still growing. So genes integrated into a liver cell will be reproduced with each new generation of cells, increasing the number of cells containing functional clotting factor genes in the adult animal.

Liver tests done when the animals were about 1 year old showed that the treated mice had an average of two factor VIII genes per liver cell. In the dogs, an average of one in eight liver cells had the new gene.

Second, newborn mice and dogs have a less-mature immune system than do adults, making it less likely they will raise an immune response to the introduced factor VIII. The immune reaction, known as inhibitor formation, diminishes the activity of the clotting factor and has caused failure in previous attempts to correct hemophilia in mice using gene therapy.

The animals in this study have not formed inhibitors against the factor VIII protein after more than a year of follow-up.

"Naturally, the ultimate goal is for gene therapy to work in humans, but humans have a more mature immune system at birth than mice," Ponder said. "In animals more closely related to humans, there will probably be more risk of inhibitor formation, so the next step needs to be gene therapy trials in primates with hemophilia to see if we can prevent inhibitor formation."

Gupta

Published in business and medical journals

– from Page 1

leader in executive education and programs."

Anjan Thakor, Ph.D., the John E. Simon Professor of Finance, chaired the dean search committee. Thakor said Gupta has been an integral part of the school's growth since he first joined the faculty.

"Mahendra represents the best of Olin in teaching, research, community service and preparing tomorrow's business leaders," Thakor said.

Said Charles F. Knight, chairman emeritus of Emerson and chair of Olin School's National Council, "Stuart has taken a number of steps that have significantly strengthened the school. These include the addition of Ken Bardach as director of executive education, Jim Beirne as director of career services and Anjan Thakor as the John E. Simon Professor of Finance, along with the recruiting of several other excellent faculty members.

"As senior associate dean for two years, Mahendra has gained a deep familiarity with the Olin School, its students and its faculty," Knight added. "He is well-positioned to transition into the dean's position and to lead the school to greater excellence, building on the many achievements of the past decade."

Gupta's research has been published in leading academic journals in the United States and abroad. He is on several editorial boards, including *The Accounting Review*, *The Journal of Management Research*, *Canadian Accounting Review* and *Accounting Horizons*.

Because of his work in health-service management, several of Gupta's papers have appeared in medical journals, including the *Journal of the American Medical Association* and *The American Journal of Managed Care*.

At WUSTL, Gupta has served in many capacities to help the Olin School grow. He's worked on curriculum-development committees for the B.S.B.A., M.B.A. and executive education programs. He has also been a member of the business school's business strategy committee.

Gupta's work is not confined to the business school. For two years, he was on the University's Center for Aging committee.

Gupta repeatedly has received recognition from the community for his contributions to the Olin School. Students have given him the Reid Teaching Award seven times since 2001.

Gupta grew up in India, where he attended Bombay University and earned a bachelor's degree in statistics and economics. He went on to receive a master's in industrial administration from Carnegie Mellon University.

Before pursuing an academic career, he held various managerial positions at companies in India.

In 1986, he moved back to the United States to attend Stanford University's Graduate School of Business, where he earned a doctorate in 1990. He was awarded first place in the American Accounting Association's doctoral dissertation competition for best work in managerial accounting.

Gupta and his wife, Sunita, have two children, Vivek and Sumi.

Campus Watch

The following incidents were reported to University Police **April 27-May 4**. Readers with information that could assist in investigating these incidents are urged to call 935-5555. This information is provided as a public service to promote safety awareness and is available on the University Police Web site at police.wustl.edu.

April 27

4:58 p.m. — An Illinois license plate tab was stolen from a vehicle parked in the Snow Way Garage sometime between 8 p.m. April 23-9:30 a.m. April 25. There are no suspects or witnesses.

Crime alert

University Police issued the following on April 28:

There have been several vehicle thefts from parking lots on campus over the past week. In particular, Dodge Ram 1500 pick-up trucks have been targeted. These thefts appear to fit a pattern of similar incidents in communities surrounding the campus.

Precautions:

- Report suspicious persons or activity immediately to University Police at 5-5555 or go to the nearest emergency telephone.
- If you hear a vehicle alarm, contact police immediately.
- Do not leave expensive property such as CDs, purses, radar detectors, cell phones and portable stereos in plain view in your vehicle. Lock them in your trunk or take them with you.
- Lock your vehicle.

The police department offers "the club" at a reduced rate of $10. For more information, call 935-5084

Contact University Police if you have any information which might assist in this investigation.

Additionally, University Police responded to four reports of larceny, two reports each of lost article, parking violation, auto accident and disturbance, and one report each of property damage, judicial violation and assault.

Notables

Arts & Sciences to recognize six alumni

Arts & Sciences will recognize the achievements of six alumni at 4 p.m. May 20 in the Arts & Sciences Laboratory Science Building.

Edward S. Macias, Ph.D., executive vice chancellor, dean of Arts & Sciences and the Barbara and David Thomas Distinguished Professor in Arts & Sciences, will present Distinguished Alumni Awards to five individuals who have attained distinction in their academic or professional careers and have demonstrated service to their communities and the University.

The five alumni receiving the Distinguished Alumni Award are: John P. Dubinsky (A.B. 1965, M.B.A. 1967); Flint W. Fowler, Ph.D. (A.B. 1980, M.A. 1981); Henrietta W. Freedman (A.B. 1975); Diane D. Jacobsen, Ph.D. (M.L.A. 1995, M.A. 2000, Ph.D. 2003); and William B. Pollard III, J.D. (A.B. 1970).

Macias will also present the Dean's Medal to John H. Biggs (Ph.D. 1983), former chairman and chief executive officer of TIAA-CREF, one of the world's largest pension systems, for his support and dedication to Arts & Sciences.

A classics major at Harvard University, **Biggs** began his career as an actuary at General American Life Insurance Co. in 1958, eventually becoming chief financial officer in 1970. From 1977-1985, he was WUSTL's vice chancellor for administration and finance.

In 1985, he became president and CEO of Centerre Trust Co. He joined TIAA-CREF as president in 1989, became chairman and CEO in 1993 and retired in 2002.

He and his wife, Penelope (M.A. 1968, Ph.D. 1974), established a residency in the classics, which over the years has brought 16 nationally recognized scholars to WUSTL, and recently endowed a distinguished professorship in classics. A trustee since 1988, he chairs the board's Investments Committee.

A leading St. Louis banker and WUSTL trustee, **Dubinsky** is president and chief executive officer of Westmoreland Associates LLC and chairman and chief executive officer of CORTEX (Center of Research Technology and Entrepreneurial Expertise).

He began his career with Mark Twain Bank, becoming president and CEO in 1986. Instrumental in forming BJC HealthCare, Dubinsky chaired its board from 1998-2004 and remains a vice chairman.

He has served on WUSTL advisory groups, including national councils for the School of Medicine and the Olin School of Business. Holding five degrees between them, Dubinsky and his wife, Yvette (A.B. 1964, M.A. 1966, M.F.A. 1990), are among the University's strongest academic supporters.

After earning degrees in psychology from WUSTL, **Fowler** earned a doctorate in education from Saint Louis University. As director of INROADS/St. Louis from 1981-1996, he worked to promote the social, personal, educational and vocational development of St. Louis youth.

In 1996, he became executive director of the Herbert Hoover Boys & Girls Club, which serves 2,600 children, primarily from low-income, single-parent homes. The north St. Louis club recently completed a 28,000-square-foot expansion to extend services to 1,000 more children.

His WUSTL leadership includes 19 years on the Black Alumni Council and his work on the Steering Committee of The Tie That Binds scholarship initiative.

Freedman completed more than two years of course work at Harris State Teacher's College in the early 1940s, but because married women were barred from teaching, she had to leave school when she married Rudolph Freedman (B.S. 1940, M.S. 1952).

She returned to college, majoring in psychology at WUSTL, when her youngest child was in high school. She found social and industrial psychology courses particularly useful in her work at SEMCOR, the family materials fabrication business.

She founded the Arts & Sciences Scholarship Program and the Lifelong Learning Institute; served on the Board of Trustees as Alumni Board of Governors chair and as a Shepley Trustee; and continues to serve on the Arts & Sciences National Council and the Center for Aging Advisory Board.

After earning a mathematics degree from Queens College of the City University of New York in 1965, **Jacobsen** joined IBM, where she had a succession of senior executive management positions. She eventually became a health-care executive and then president and CEO of Dependable Insurance Group.

After her husband, the late Thomas H. Jacobsen, was appointed chairman, president and CEO of the former Mercantile Bank in St. Louis in 1989, she earned two master's degrees and a doctorate in international affairs at WUSTL.

She was the driving force in creating the undergraduate International Leadership Program in Arts & Sciences. An Arts & Sciences National Council member, she also lends her expertise to the Graduate School of Arts & Sciences.

A Manhattan attorney, **Pollard** is a partner in the commercial litigation firm of Kornstein Veisz Wexler & Pollard. He earned J.D. and M.B.A. degrees at Columbia University.

He served 11 years as a federal prosecutor in the U.S. Attorney's Office for the Southern District of New York, considered the nation's premier prosecutorial office. When he was promoted to deputy chief of the criminal division, Pollard oversaw national security and terrorism matters.

He serves on the Black Alumni Council, the Arts & Sciences National Council and the Regional Cabinet. He and his wife, Renée, longtime annual scholarship supporters, have established the Pollard Endowed Scholarship in Arts & Sciences.

For the Record

Shirley K. Baker, dean of University Libraries and vice chancellor for information technology, has been appointed to a three-year term to the National Institutes of Health's PubMed Central National Advisory Committee. She has also agreed to serve a two-year term on the Advisory Board for the Canadian Research Knowledge Network, a collaborative program of Canadian universities that aims to provide access to digital publications for the academic community nation-wide. …

The WUSTL Model United Nations club recently was named "Best Small School Delegation" at a Model U.N. conference hosted by the University of Chicago. …

John E. McCarthy, Ph.D., professor of mathematics in Arts & Sciences, has received a five-year, $270,000 grant from the National Science Foundation to study "Operator Theory and Complex Geometry." …

The Movement Science Program received national recognition with the MENTOR Award from the National Institute of Child Health and Human Development. This award is presented to the school that received top reviews on its grant application and provides superior training to its predoctoral students. Only one school receives the MENTOR award each year. …

At the recent annual meeting for the Midwest Section of the American Society of Plant Biologists, which was held at the Donald Danforth Plant Science Center, WUSTL undergraduate **Kiani Arkus** won the award for "Best Undergraduate Presentation," accompanied by a $100 prize, for her work titled "Mechanistic Analysis of Wheat Chlorophyllase Reveals a Connection to the Carboxyesterase Enzyme Family." Arkus is a sophomore majoring in biology in Arts & Sciences. …

Rebecca Rogers, Ph.D., assistant professor of education in Arts & Sciences, was recently awarded the Early Career Award by the National Reading Conference. Given annually, the award recognizes scholars who have made significant contributions to literacy research and education early in their careers. …

Theodore J. Cicero, Ph.D., vice chancellor for research and associate vice chancellor/associate dean in the School of Medicine, is one of four members recently elected to the Oak Ridge Associated Universities' (ORAU) board of directors. ORAU is a university consortium leveraging the scientific strength of 91 major research institutions to advance science and education by partnering with national laboratories, government agencies and private industry.

Stalker Prize goes to Mahadevan, Weiss

BY TONY FITZPATRICK

The 2005 Stalker Prize, given in honor of Harrison D. Stalker, Ph.D., a dedicated WUSTL biology teacher and scientist with an exceptional interest in the arts and humanities, was awarded to Navin Mahadevan and Elliott Weiss.

The award was given for their outstanding academic performances and diversity of courses taken at the University.

Both have done notable research in the School of Medicine and both have traveled abroad extensively.

Mahadevan's involvement in community service was his participation in Feed St. Louis, a student-run organization that serves homeless and women's shelters. He has also been very active in writing and directing cultural dance productions for Ashoka, the University's Indian student group.

Weiss has been involved in many WUSTL community projects, but his greatest commitment has been as a counselor with the Sexual Assault and Rape Action Hotline, or SARAH, which is dedicated to helping students cope with sexual abuse.

MARY BUTKUS

A TRIO of awards Seniors Connie Edwards (left) and Michael Amijo were named Outstanding TRIO Students of the Year and classmate Asena Madison (right) received the Outstanding TRIO Achiever Award during a ceremony April 27 in the Women's Building Formal Lounge. The Outstanding TRIO Student of the Year Award recognizes seniors who have taken advantage of a broad array of TRIO services and have been mentors to other students in the program. The Outstanding TRIO Achiever Award recognizes a senior who has excelled in the areas of leadership, scholarship and community service. Started more than 30 years ago by the U.S. Department of Education, TRIO programs target students who are first in their families to go to college, low-income by federal guidelines, have a learning or physical disability and/or are veterans.

Employment

Go online to hr.wustl.edu (Hilltop Campus) or medicine.wustl.edu/wumshr (Medical Campus) to obtain complete job descriptions.

Hilltop Campus

For the most current listing of Hilltop Campus position openings and the Hilltop Campus application process, go online to hr.wustl.edu. For more information, call 935-5906 to reach the Human Resources Employment Office at West Campus.

- Research Statistician 040221
- Programmer in A&S Computing 050012
- Clinical Study Coord. 050048
- Dir. of Development, School of Law 050085
- Reference Librarian/Instruction & Outreach Coord. 050098
- Asst. Dir. for Disability Resources 050099
- Software Developer 050104
- Project Manager 050115
- Staff Psychologist/Counselor/ Clin. Soc. Worker 050174
- Assoc. Dir., Chief Physician 050176
- Coord., Student Involvement/ Multicultural Spec 050178
- Asst. Dean 050181
- Coord. Of Experimental Computing 050186
- Managing Editor 050188
- Instructional Technology Specialist 050193
- Research Technician 050194
- Asst. Swimming Coach 050195
- Deputized Police Officer 050196
- Administrative Asst. 050197
- Academic & Administrative Manager 050200
- Radiation Safety Specialist I 050201
- Contract Coord. 050202
- Lab Technician IV 050206
- Applications Developer 050210
- Asst. Athletic Trainer 050211
- Admin. Asst. (Half Time) 050212
- Student Resource Asst. 050214
- Graduate Business Registrar 050125
- Clinical Program Coord. 050216
- Accounting Clerk 050217
- Project Administrator 050218
- Head Women's Tennis Coach 050219
- Accounting & Payroll Asst. 050220
- LAN Engineer 050221

Medical Campus

This is a partial list of positions in the School of Medicine. Employees: Contact the medical school's Office of Human Resources at 362-7196. External candidates: Submit résumés to the Office of Human Resources, 4480 Clayton Ave., Campus Box 8002, St. Louis, MO 63110, or call 362-7196.

- Research Patient Coord. 041006
- Secretary III 050491
- Medical Secretary II 051051
- Program Coord. 051140
- RN Staff Nurse 051165
- Research Asst. 051204
- Research Patient Coord. 051207
- Research Laboratory Manager 051208
- Animal Care Technician II 051210
- Research Technician I 051212
- Facilities Technician III 051213
- Reimbursement Supervisor 051214
- RN — Research Patient Coord. 051215
- Research Technician II 051216
- Division Administrator 051218
- Research Patient Coord./Professional 051219
- Secretary I 051220
- Research Patient Coord. 051222
- Research Technician II 051223
- Staff Scientist 051224
- Certified Coder 051225
- Manager Application Programming & Development 051228
- Medical Asst. II 051229
- Coord. Marketing Services 051230

Washington People

Straight from the heart

Excellence and dedication define cardiologist Bruce D. Lindsay

By Diane Duke Williams

When he was young, Bruce D. Lindsay, M.D., associate professor of medicine, liked to wrestle. Back then, his opponents were scrappy kids from Haddonfield, N. J., bent on proving their worth.

Today, the stakes are higher for Lindsay, but the characteristics of a good wrestler — intelligence, action and especially perseverance — are clear in his accomplishments.

Like many high school students, academics often took a back seat to having a good time for Lindsay.

"I never dreamt I'd go to medical school," he says. "I think some of my teachers would be surprised at what I'm doing now."

But once he was in college, Lindsay developed a long-term vision of where he wanted to be and stayed the course even when things weren't easy. Midway through his freshman year at Eckerd College, a liberal arts school in St. Petersburg, Fla., he decided to study medicine.

He graduated from Jefferson Medical College in 1977 and completed a residency at the University of Michigan. To pay back his scholarship obligations to the National Health Service Corps, the agency assigned him to an internal medicine practice for three years in East Jordan, Mich., a rural town in the northern part of the state.

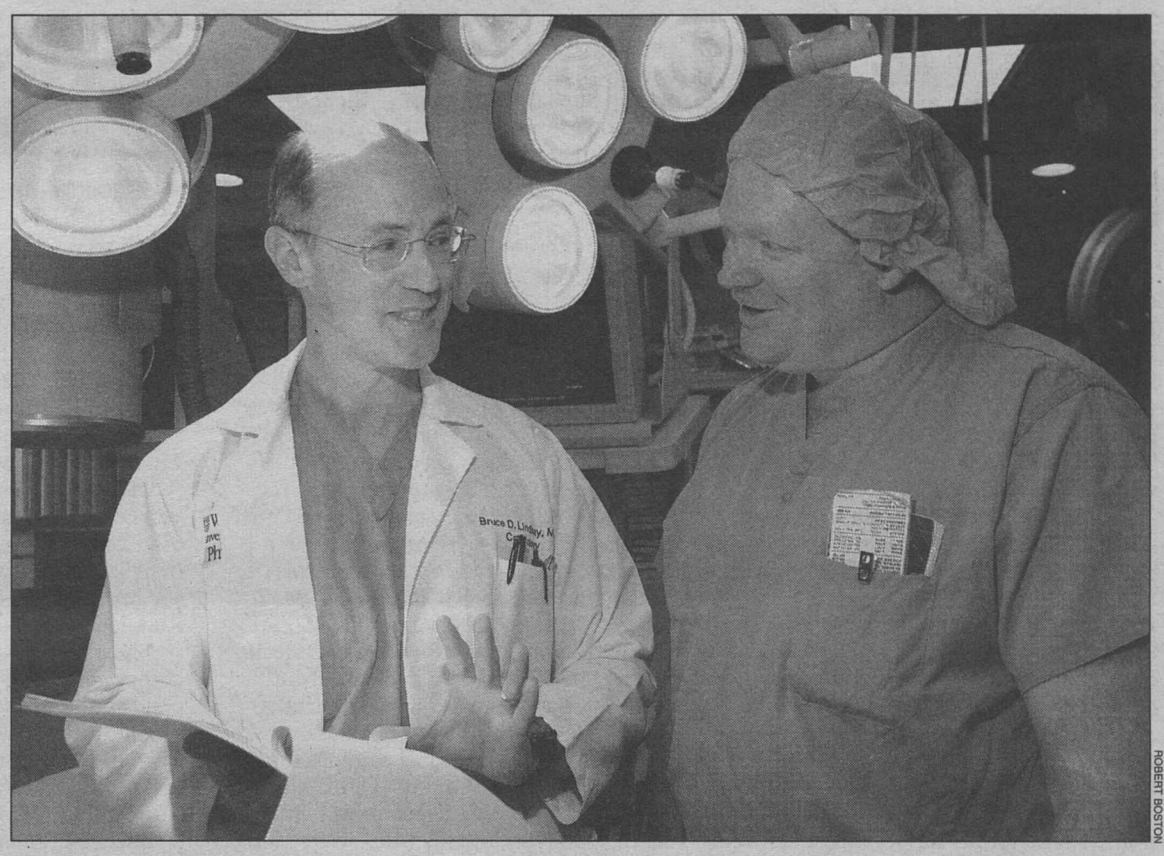
Treating patients there showed him how little was known about arrhythmias, or abnormalities in the electrical currents that allow the heart to beat.

People with this condition experience racing hearts, and they often feel as if they're going to pass out. All arrhythmias are not life threatening, but they can greatly affect patients' lives, spurring many trips to doctors' offices and emergency departments.

"I would call the nearest cardiologist, who was about 40 miles away, but they didn't know how to treat these patients either," Lindsay says. "They weren't bad cardiologists — it was just where the field stood in 1980."

Lindsay decided to pursue a fellowship in cardiology and study arrhythmias, landing at Washington University School of Medicine in 1983. Today, he is an expert on the subject.

"He is a superb clinician and highly respected at national and international levels as an authority on heart-rhythm abnormalities and their treatment," says Michael E. Cain, M.D., the Tobias and Hortense Lewin Professor of Cardiovascular Disease in Medicine, who trained Lindsay. "He's dedicated to his work and is someone who constantly tries to achieve excellence."



ROBERT BOSTON

Bruce D. Lindsay, M.D. (left), discusses selecting a defibrillator for a patient with Dennis Fogarty, who has worked with Lindsay for more than 15 years as both a nurse in the electrophysiology lab and now as an employee of a company that manufactures defibrillators. "There's been a striking change in survival rates as we've had these defibrillators implanted in people," Lindsay says.

Matters of the heart

Arrhythmias fall into two main categories: ventricular and supraventricular. Supraventricular arrhythmias occur in the heart's two upper chambers — the atrium. Ventricular arrhythmias happen in the heart's two lower chambers — the ventricles — and can lead to sudden death.

> **"He is a superb clinician and highly respected at national and international levels as an authority on heart-rhythm abnormalities and their treatment. He's dedicated to his work and is someone who constantly tries to achieve excellence."**
>
> Michael E. Cain

Since Lindsay began studying arrhythmias, major changes have occurred in their treatment. Previously, patients were treated solely with medications that required a large degree of trial and error. Also, many patients couldn't tolerate the medications very well.

When Lindsay was practicing in Michigan, the *New England Journal of Medicine* published an article about the first use of an implantable defibrillator in a patient who had a ventricular arrhythmia.

"I thought it was a very novel idea," Lindsay says. "But I never expected to meet the people who did the work, who I ultimately got to know, and I never expected to be putting those in patients."

During a sabbatical years later at Newark Beth Israel Hospital, Lindsay worked with Victor Parsonnet, M.D., and Sanjeev Saksena, M.D., who were studying the feasibility of implanting a defibrillator without opening a patient's chest. Their preliminary research in this area helped develop a technique used today to implant cardiac defibrillators.

"There's been a striking change in survival rates as we've had these defibrillators implanted in people," Lindsay says. "Now we can implant a defibrillator and send people home. If they get more arrhythmias, we may need to put them on medications, but they won't necessarily have to come into the hospital."

Treating arrhythmias with ablation — being able to pinpoint where they're coming from and using a catheter to destroy them with radiofrequency energy — also has greatly altered the field. And the School of Medicine was one of the first places in the country to do these procedures.

Mitchell N. Faddis, M.D, assistant professor of medicine, who trained under Lindsay and has worked with him since 1998 on the Clinical Cardiac Electrophysiology Service, calls Lindsay an excellent teacher, a great role model and a gifted clinician.

"I have worked with Bruce on a variety of new treatment strategies for atrial fibrillation," he says. "In spite of his clinical and administrative responsibilities, Bruce has remained committed to advancing the field of cardiac electrophysiology through his research efforts."

Lindsay has worked with Steretotaxis Inc. to develop the Magnetic Navigation System (MNS), which enables heart-rhythm experts to use magnetic fields to guide catheters to treat arrhythmias.

Andrew F. Hall, now director of research collaboration for Siemens Medical Solutions, AX Division, worked with Lindsay for seven years to develop the Magnetic Navigation System. Hall, like many of Lindsay's colleagues, was struck by his perseverance.

"There were times when I wasn't sure this was going to work, but he kept trying," Hall says. "I think a lot of physicians would have said, 'I don't think I can continue with this,' but he stuck with it through thick and thin."

Lindsay also holds national leadership positions in the American College of Cardiology and the Heart Rhythm Society.

In these positions, he has helped develop new health-care policy, such as the expansion of Medicare coverage for patients who receive an implantable cardiac defibrillator to prevent sudden death.

"I've come to appreciate that the professional organizations do a great deal to help improve the quality of our practices, through education, supporting research and advocacy," Lindsay says.

"We have to stand up for ourselves, challenging insurance companies and making sure government policies take into consideration things that are important to us and to our patients."

Balancing act

Balancing his time is his greatest challenge, Lindsay says. And he attributes much of his success to the support of his wife, Elizabeth, a math teacher at Chaminade College Prepatory School.

When they do get away for vacation, they like to hike and have been to most of the national parks. Last year, they explored Olympia National Park.

They also have three children. Shane, 26, is a marriage and family counselor in Louisville, Ky.; Dana, 24, is a Spanish teacher in a magnet school in New York City; and Marcia, 21, is an international politics major at Illinois Wesleyan University in Bloomington, Ill.

When Lindsay came to St. Louis in 1983 for his cardiology fellowship, he thought he would move on after three years. But it turned out to be a great environment for him and his family, and he feels lucky to have had the opportunities he's had.

"Witnessing all the changes in the treatment of arrhythmias is one of the things that has kept me here," Lindsay says. "It seems as if no year is exactly like the other one. We're always changing how we do things and finding better ways to do it, and it's fun to be on the cutting edge."

COURTESY PHOTO

When he's not working, Lindsay enjoys traveling to parks with his family: (clockwise from left) daughter Dana, son Shane, wife Elizabeth, his parents and daughter Marcia.

Bruce D. Lindsay

Years at the University: 22 years

Hometown: Haddonfield, N.J.

University titles: Director of Clinical Electrophysiology Laboratory and associate professor of medicine in the Division of Cardiology

Family: Wife, Elizabeth, and children, Shane, 26; Dana, 24; and Marcia, 21

Hobbies: Spending time with his family and hiking in national parks